Modeling, Simulation and Training Product Area Directorate (MST PAD)

Executive Overview C2 M&S Center of Excellence 4 Nov 98

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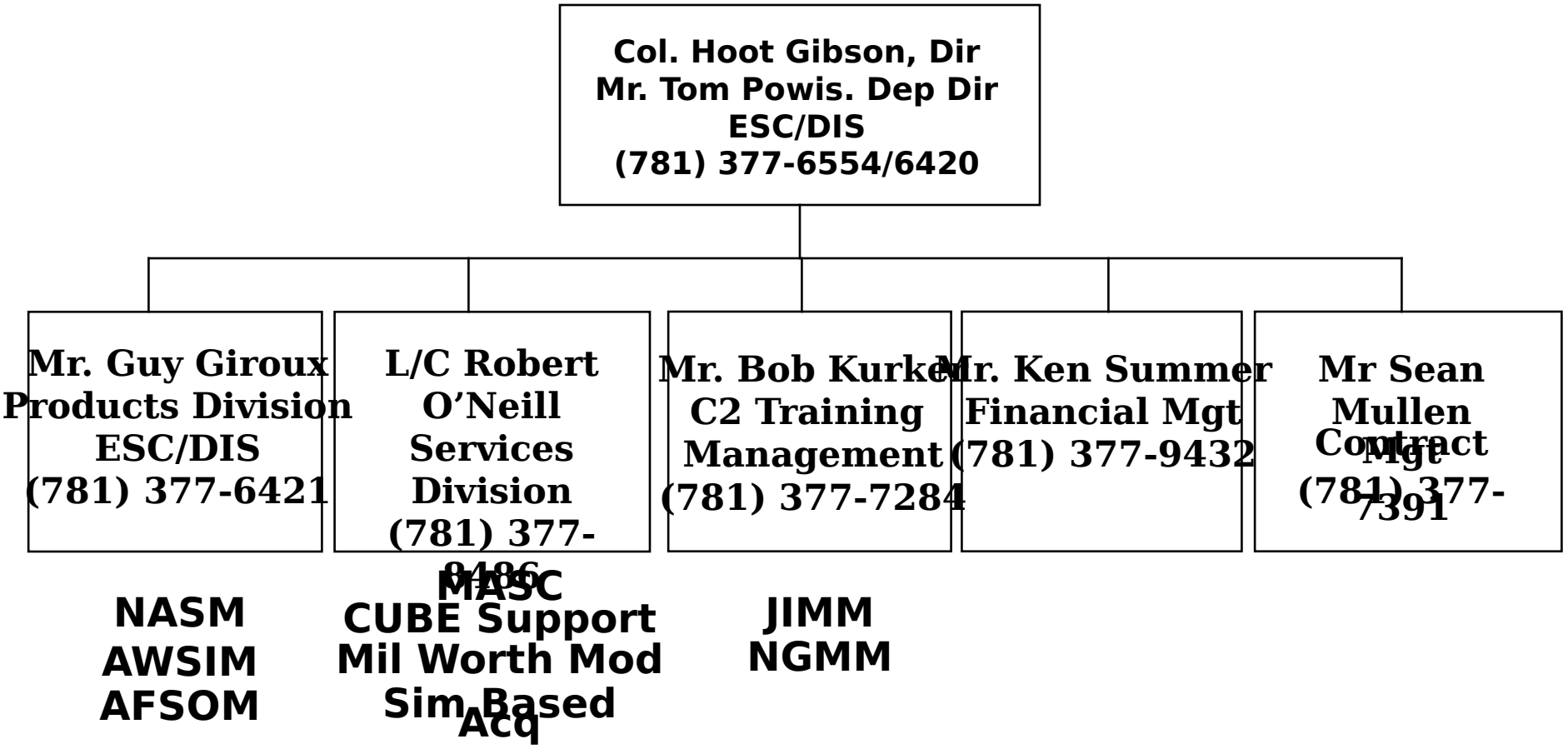
MST PAD Organization



MST PAD Mission

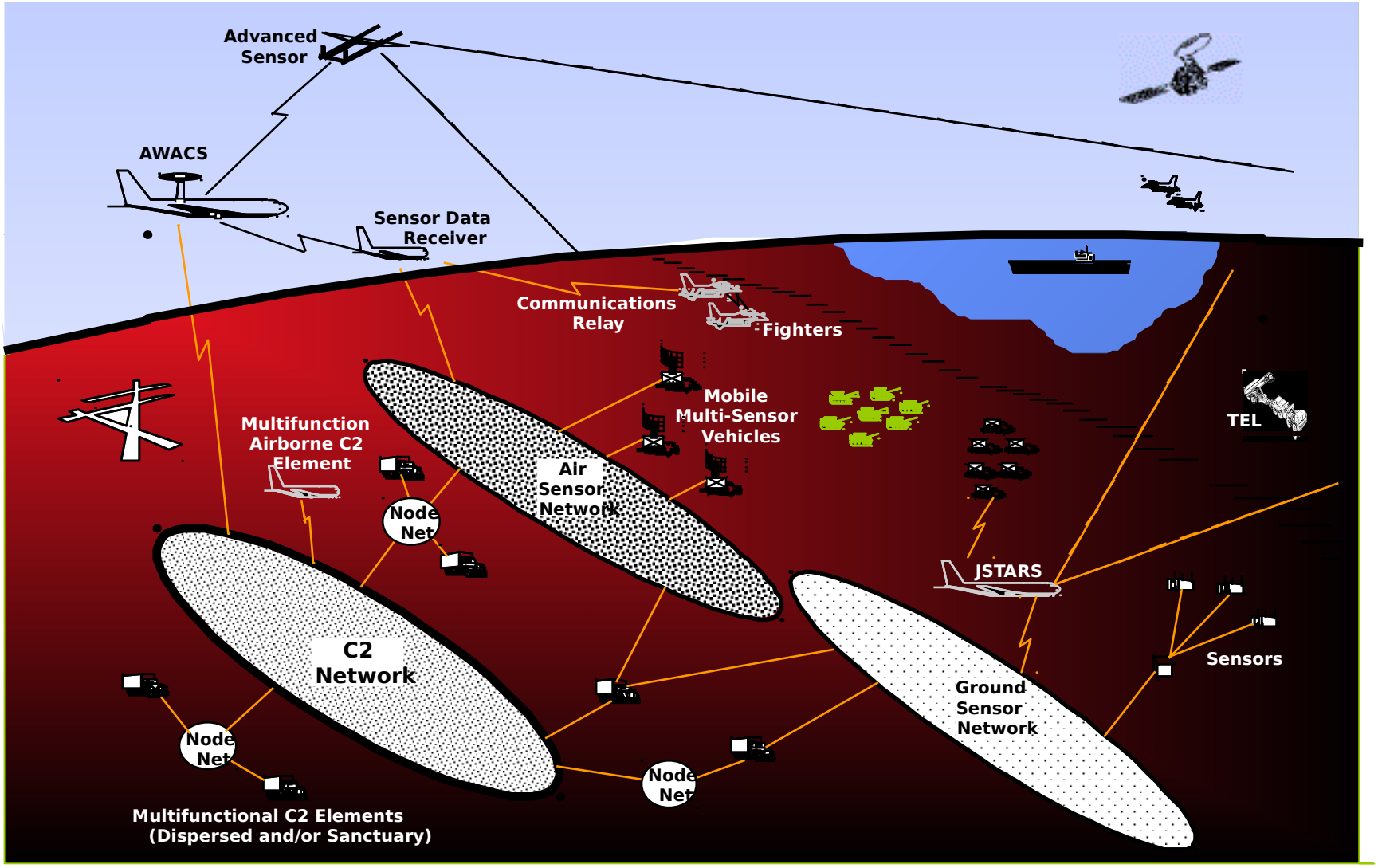
Provide our customers (wargaming centers, ESC SPOs) M&S products, tools & services to

- **Do C2 better (training) and make better C2 decisions (decision aids, training, exercises, wargames)**
- **Practice decision making, and see the results of those decisions played out convincingly through simulation**
- **Do command and control acquisition faster, better and cheaper**
- **Allow the ESC acquisition process to deliver a more operationally effective C2 weapon system to the warfighter**

PAD Functions

- C2 Analysis
  - Support to ESC SPOs conducting analyses of alternatives
  - Course of action (COA) assessment tools for the warfighter
- C2 Training
  - Principal battlestaff training tools for USAF
    - Air Warfare Simulation; AF Suite of Models (AWSIM/AFSOM)
    - National Air and Space [Warfare] Model (NASM)
  - Improving/standardizing training management in ESC products
    - Three day hands-on course; 1/2 day executive course
- C2 Testing
  - Simulated environment generation for tests, exercises, demonstrations and experiments
- C2 Acquisition
  - Developing tools/processes for C2 simulation based acquisition (SBA)

Modeling Analysis and Simulation Center (MASC) Charter
-- Model & Analyze the C4ISR Battlefield
-- Utility and Effectiveness in SOS Context



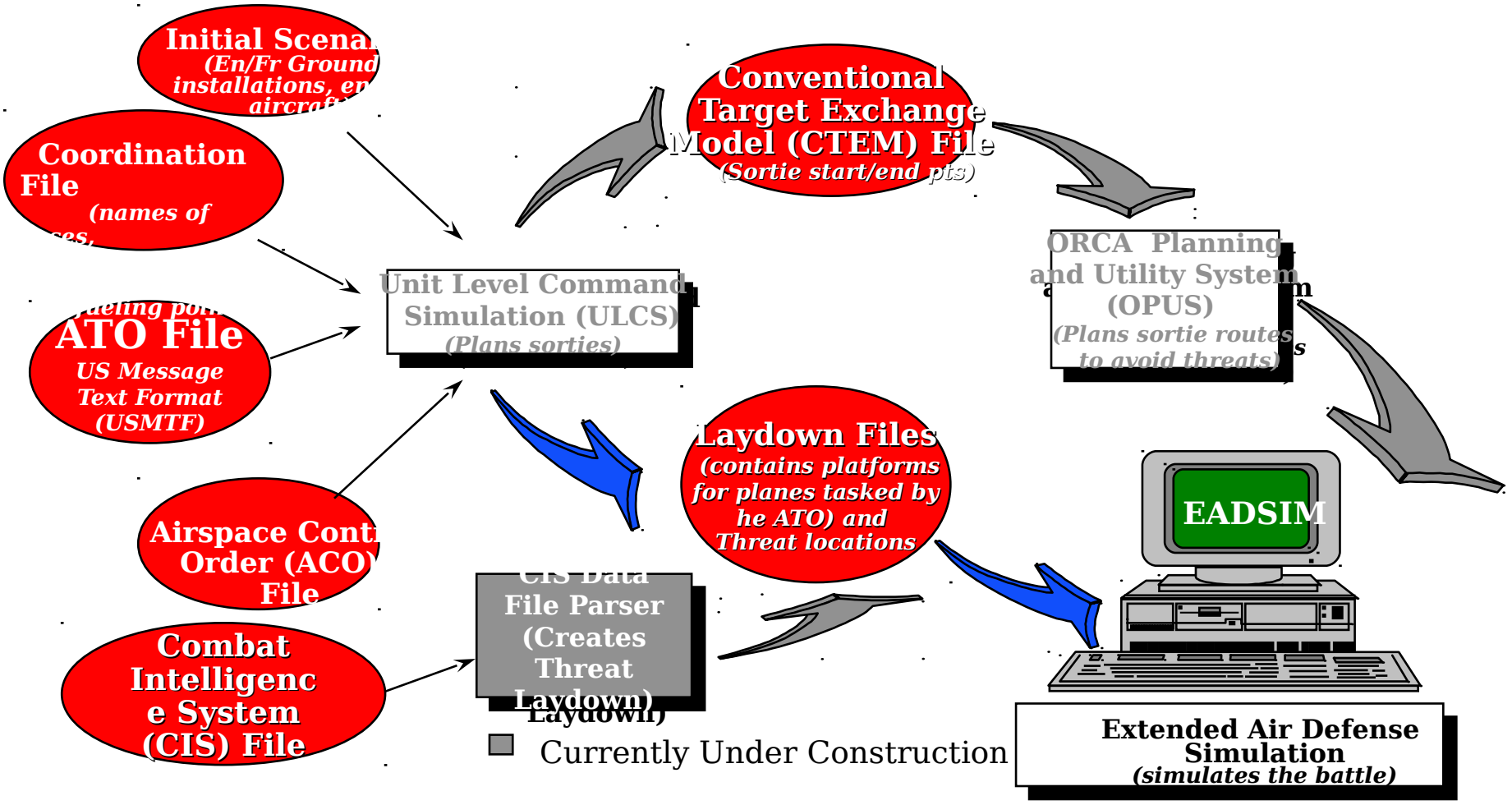
Modeling, Analysis, and Simulation Center (MASC)

- C2, comm, and ISR modeling, simulation and analysis to support:
  - Concept development
    - UAV bistatic surveillance analysis (Rome Lab)
  - Systems Development
    - JSTARS COEA/AOA (ACC)
    - JTIDS COEA/AOA (JTIDS SPO)
  - Systems Engineering
    - JTIDS TMD analyses (BMDO & JTAMDO)
  - Systems Integration
    - CUBE stimulation for COP Study (PEO TBMCS); and EFX
    - Network Capacity Analysis (MAJCOMS, SSG)
  - Modernization Planning
    - Military worth analyses of SIGINT, IMINT, IPB for ISR TPIPT
- C2, comm, and ISR model enhancement, and/or development & federation with community models

Key Questions Answered by AF Network Capacity Planning

- How much bandwidth does an AIS use?
- Where should an AIS server be located?
  - Locally on base
  - Remotely at DISA Defense Megacenter (DMC)
- Is the AIS architecture suitable for the network infrastructure?
- How much network capacity is needed to handle projected traffic?

Current Air Tasking Order (ATO) Modeling & Simulation System (AMASS) Configuration


Initial Scena
(En/Fr Ground installations, en aircra
Coordination File
(names of
Conventional Target Exchange Model (CTEM) File
(Sortie start/end pts)
ORCA Planning and Utility System (OPUS)
(Plans sortie routes to avoid threats)
Unit Level Command Simulation (ULCS)
(Plans sorties)
ATO File
US Message Text Format (USMTF)
Laydown Files
(contains platforms for planes tasked by he ATO) and Threat locations
EADSIM
Airspace Contr Order (ACO) File
File Parser (Creates Threat Laydown)
Combat Intelligenc e System (CIS) File
Currently Under Construction
Extended Air Defense Simulation
(simulates the battle)

AMASS is a tool that offers the AOC "rapid utility".

Lt Gen John S. Fairfield Hq USAF/SC - Fort Franklin IV

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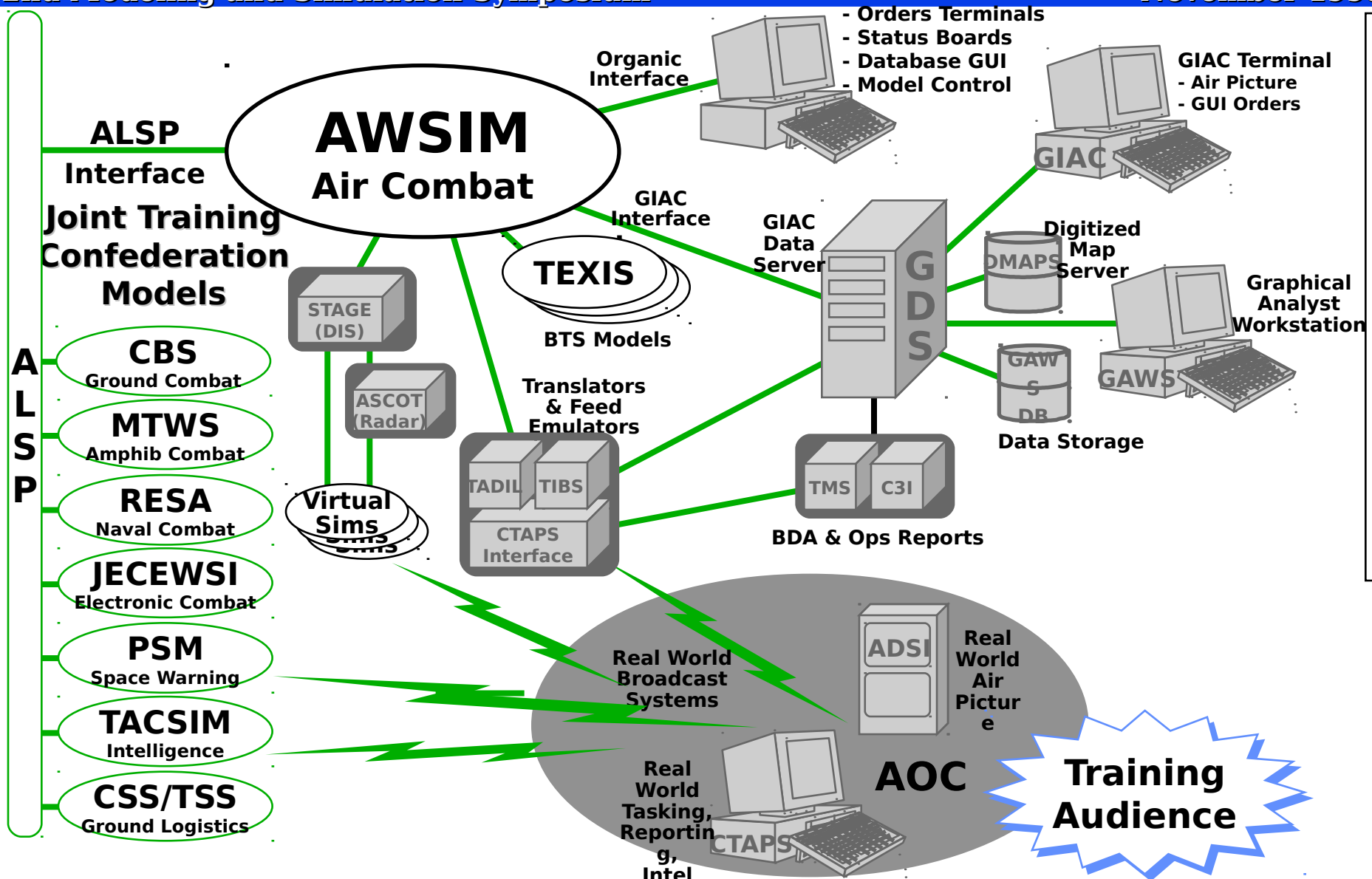
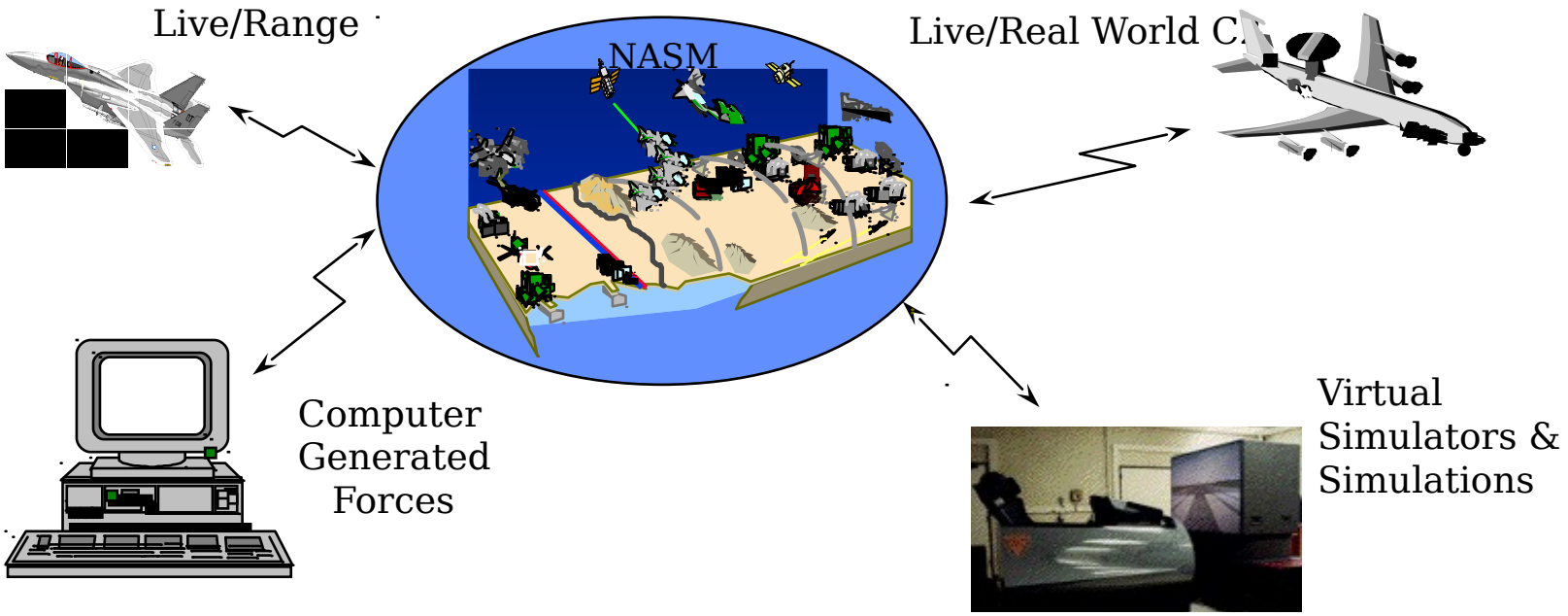
Air Force Suite of Models (AFSOM) Technical Support

- **Four military, 15-25 contractor team provides worldwide support to AF experimentation and readiness training**
  - **Ulchi Focus Lens, USFK**
  - **Blue Flag, AC2A and CONUS NAFs**
  - **Union Flash, USAFE WPC**
  - **Expeditionary Force Experiments**
  - **And much, much more**
- **Soup-to-Nuts Technical Support for:**
  - **AWSIM/AFSOM operation in exercises/experiments**
  - **AWSIM CRs/DRs**
  - **Interfaces to CTAPS and TBMCS**
  - **Interfaces to other models and tools**
    - **LOGSIM**
    - **Distributed Interactive Simulation (DIS)**

AWSIM2 w/Joint Training Confederation



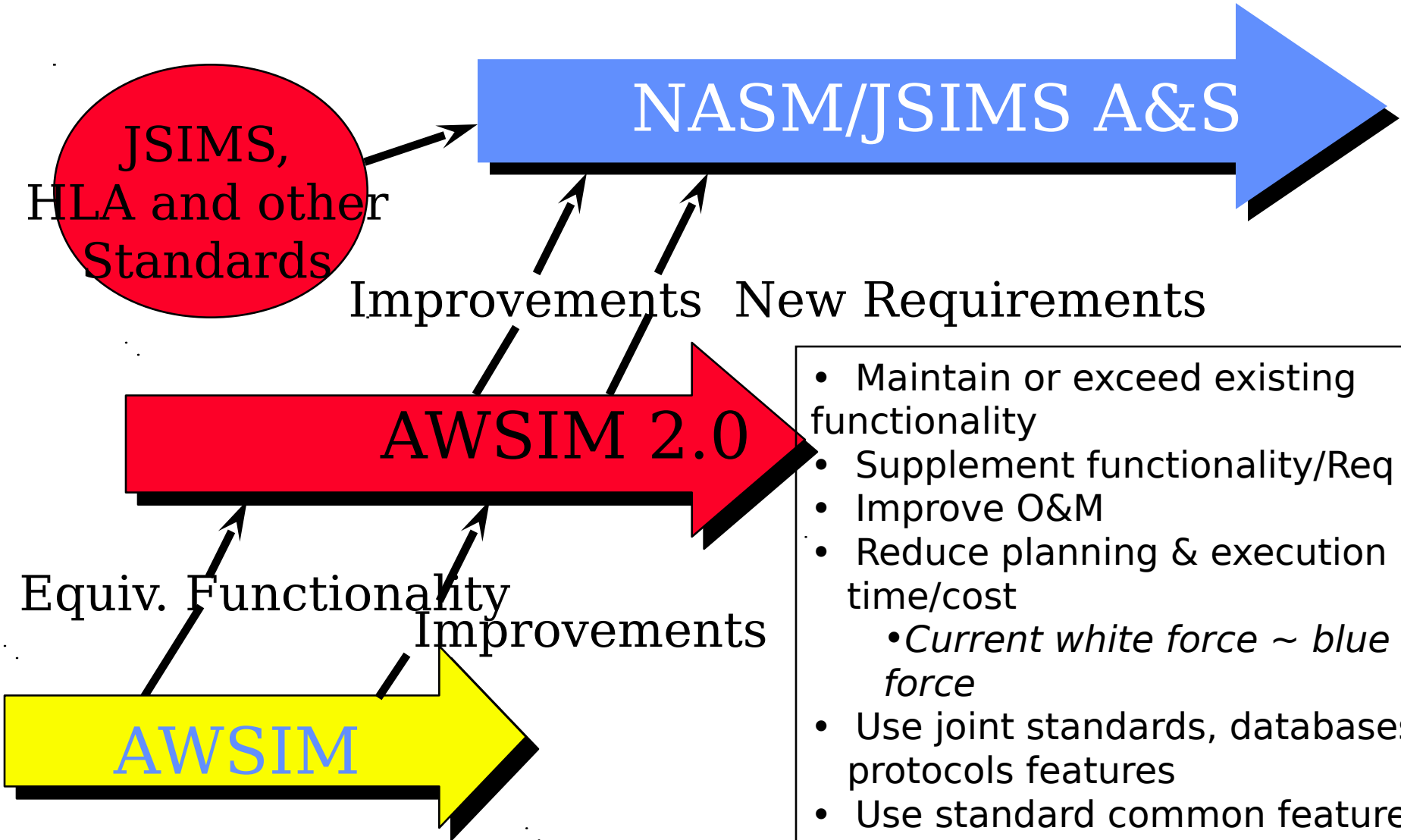
NASM Program



- Simulation that realistically represents full range of aerospace power in Air Force and Joint Operational Readiness exercises
- Provide effective battlestaff training from Wing and up
- Capability for distributed collaborative exercises

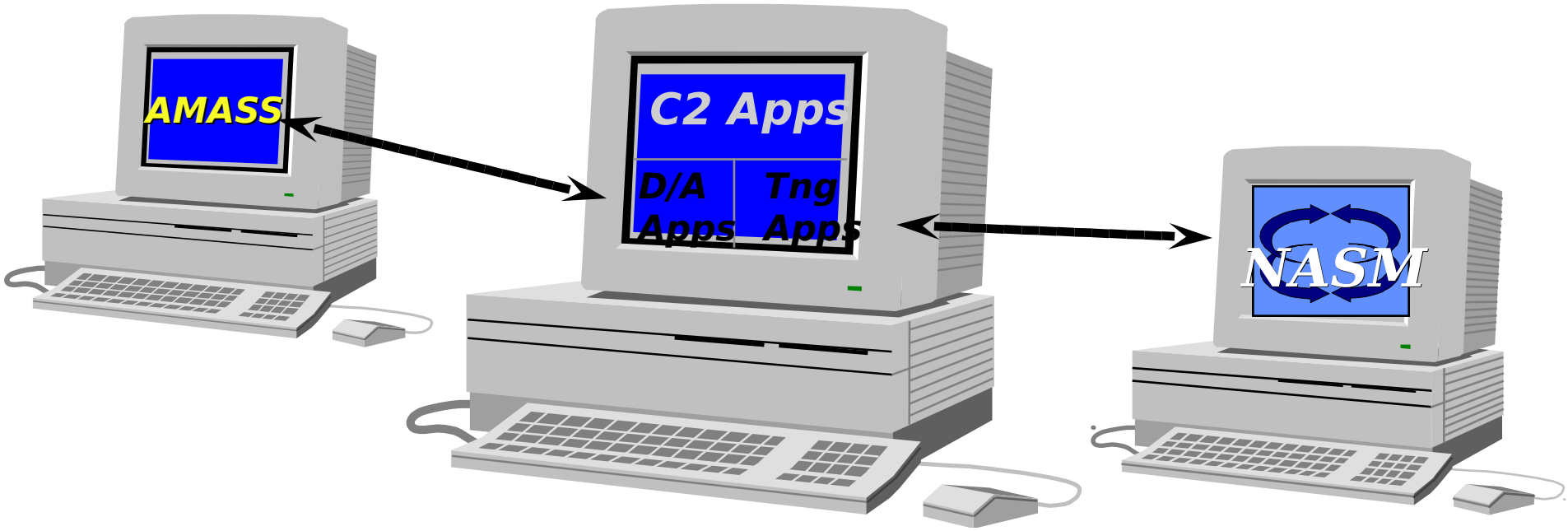
is on tailoring inputs to C2 equipment and operators. Level of realism for conflict outcome necessarily sufficient for course of action assessment

NASM/JSIMS Evolution



- Maintain or exceed existing functionality
- Supplement functionality/Req
- Improve O&M
- Reduce planning & execution time/cost
  - *Current white force ~ blue force*
- Use joint standards, databases, protocols features
- Use standard common features

Objective PAD Products for C2 Weapon System



Decision Aid (D/A) Server (HLA/DII/COE)

GCCS Workstation (DII-COE)

Training Server (HLA)

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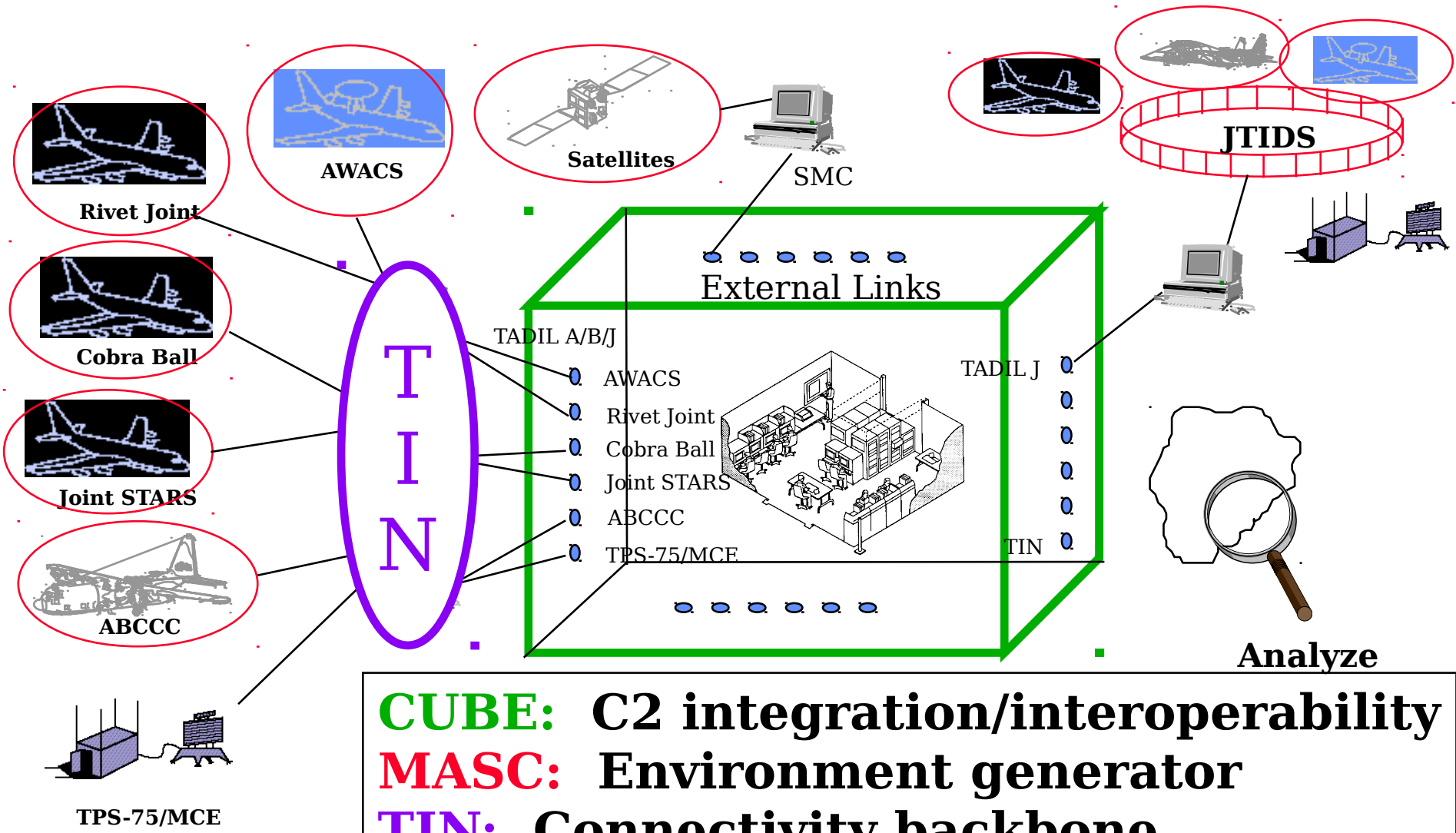
ESC Integrated C² System Environment

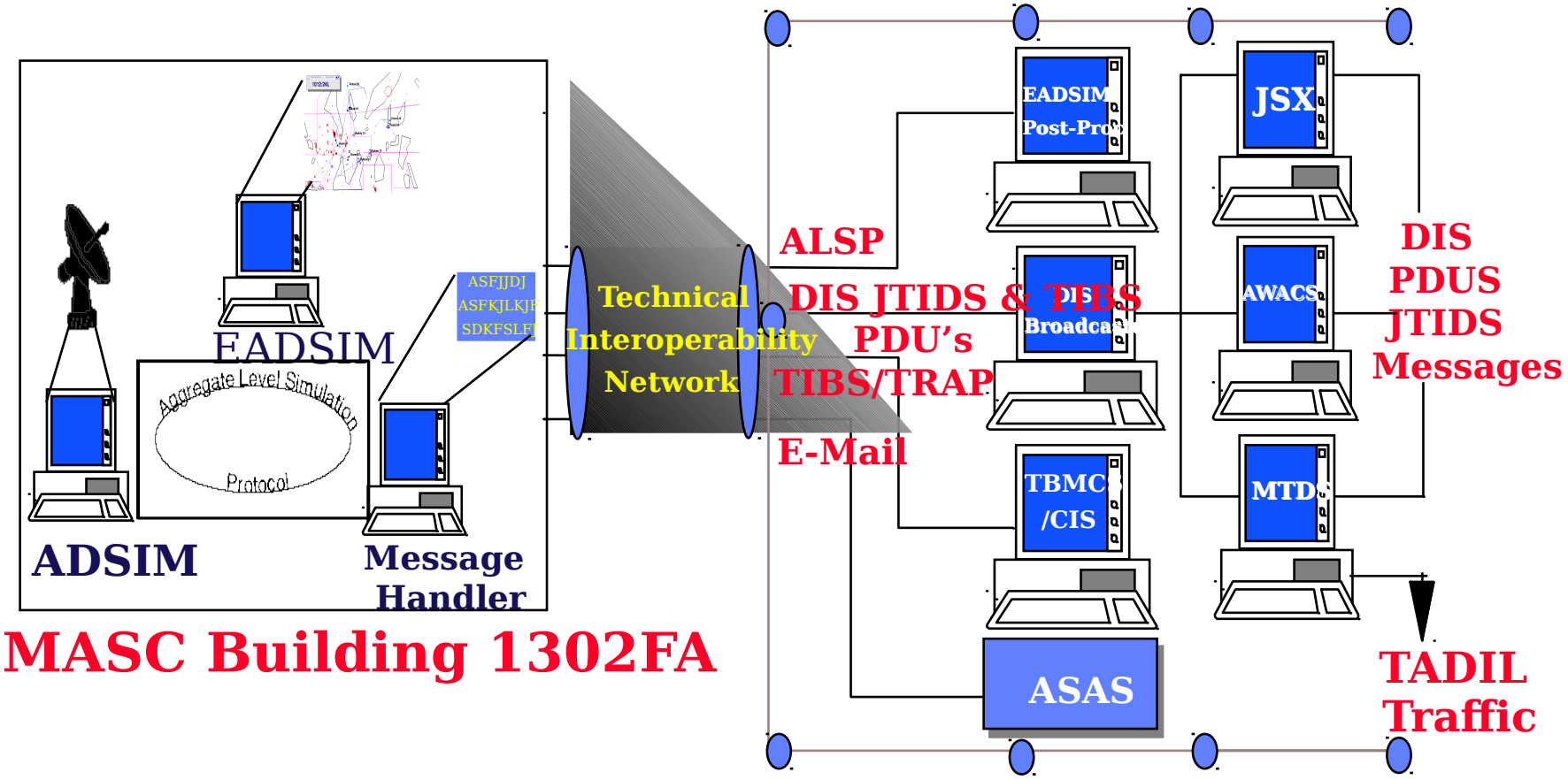


CUBE: C2 integration/interoperability

MASC: Environment generator

TIN: Connectivity backbone

MASC/CUBE Scenario Generation/Stimulation



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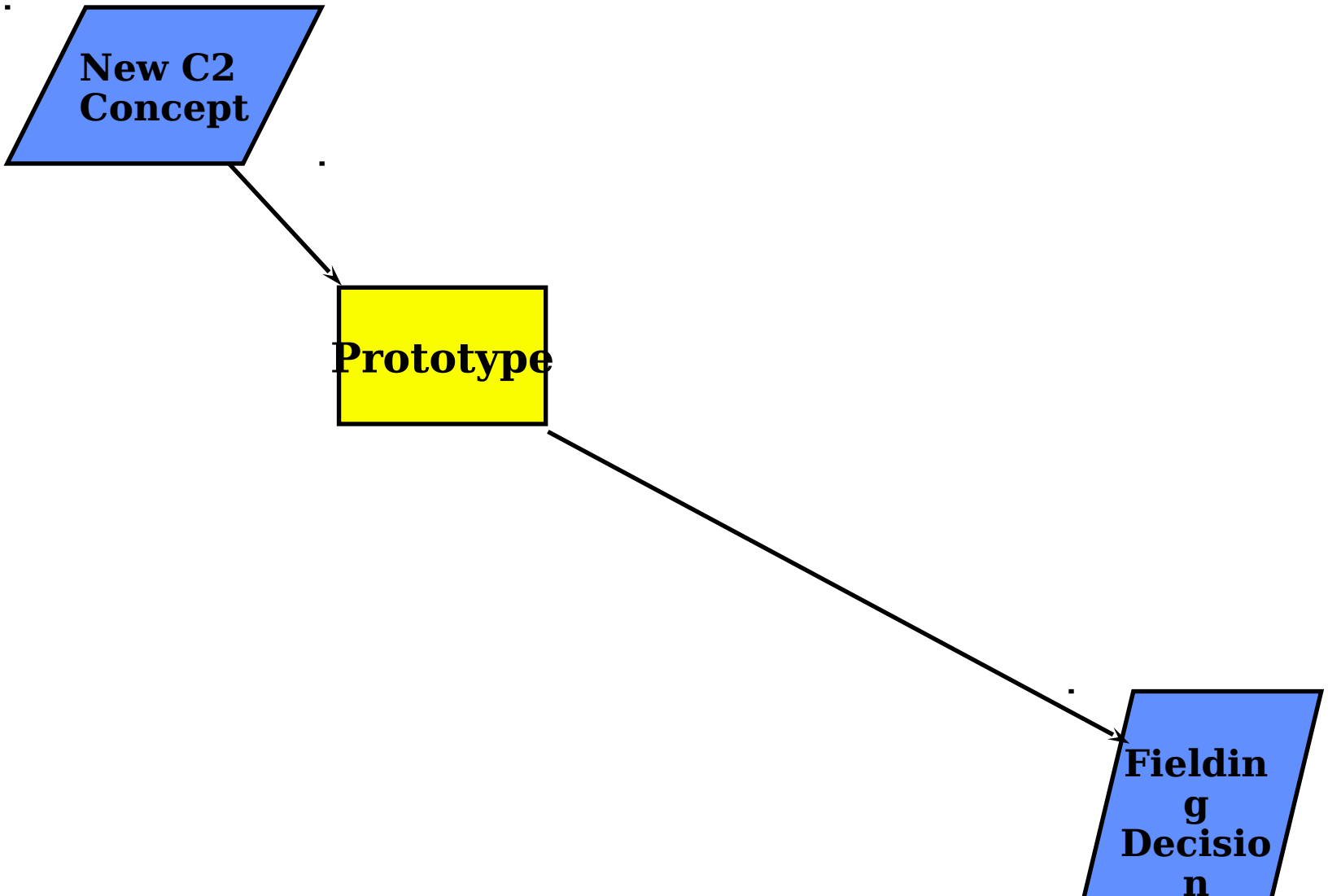
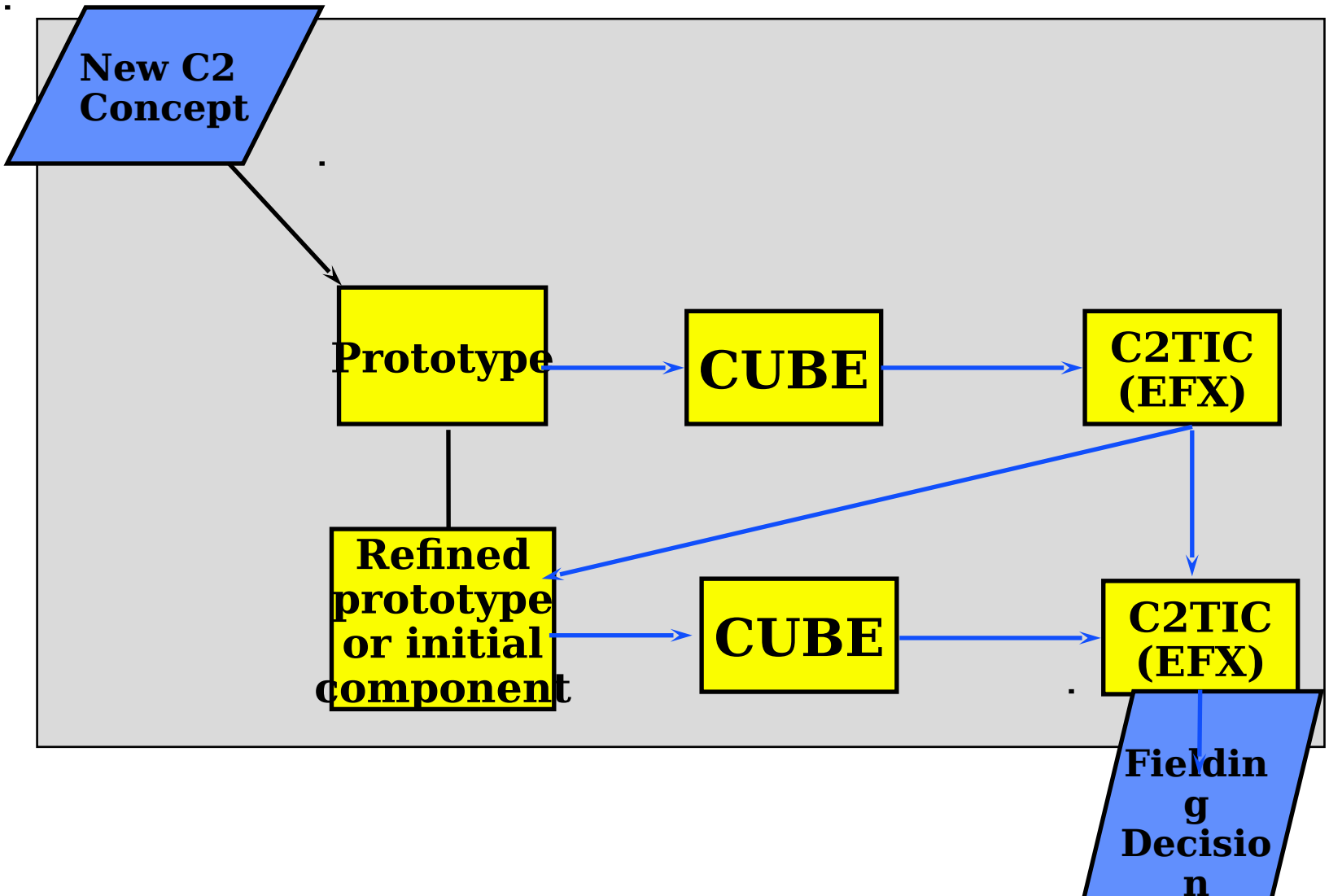
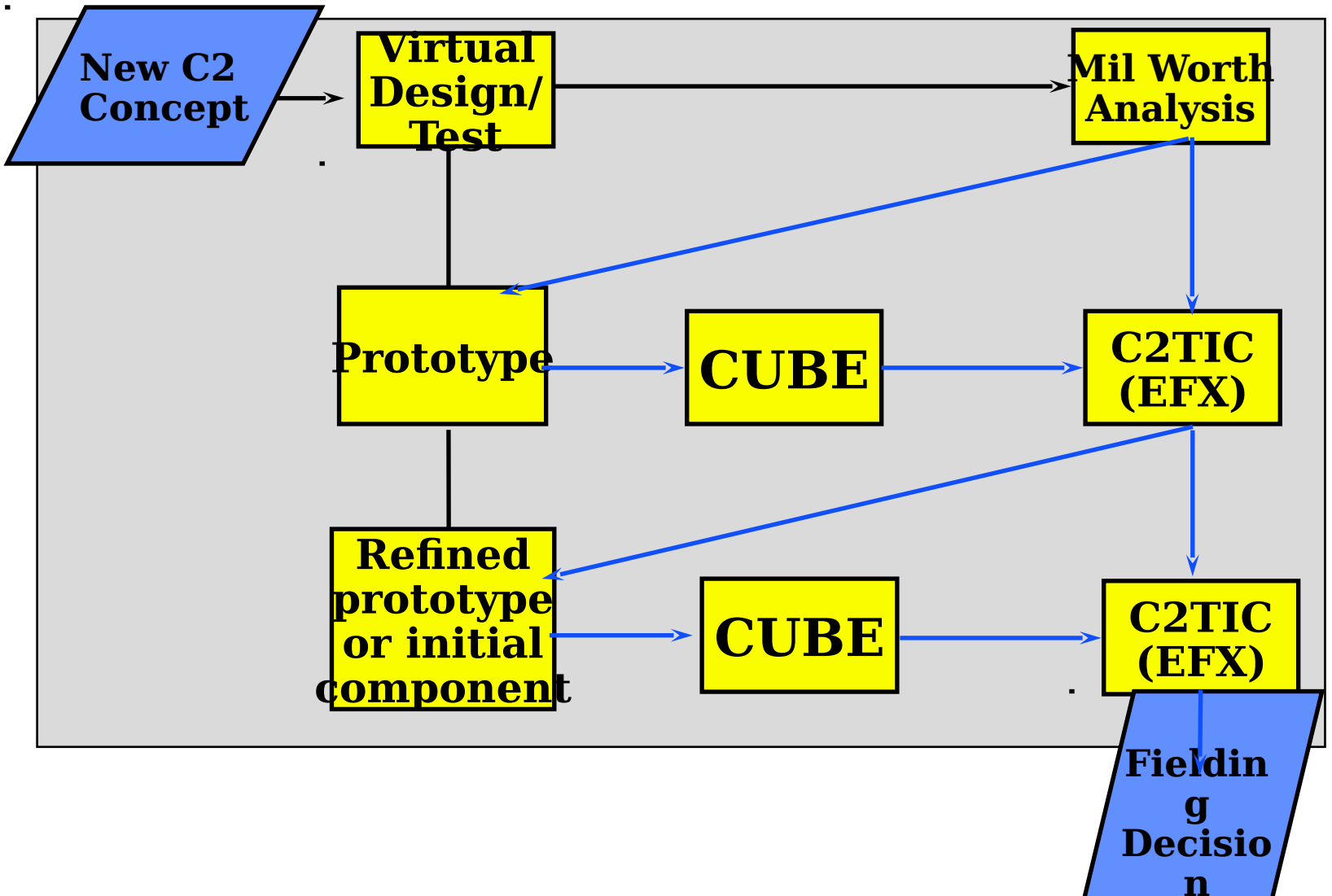
C2 Component Development
Yesterday



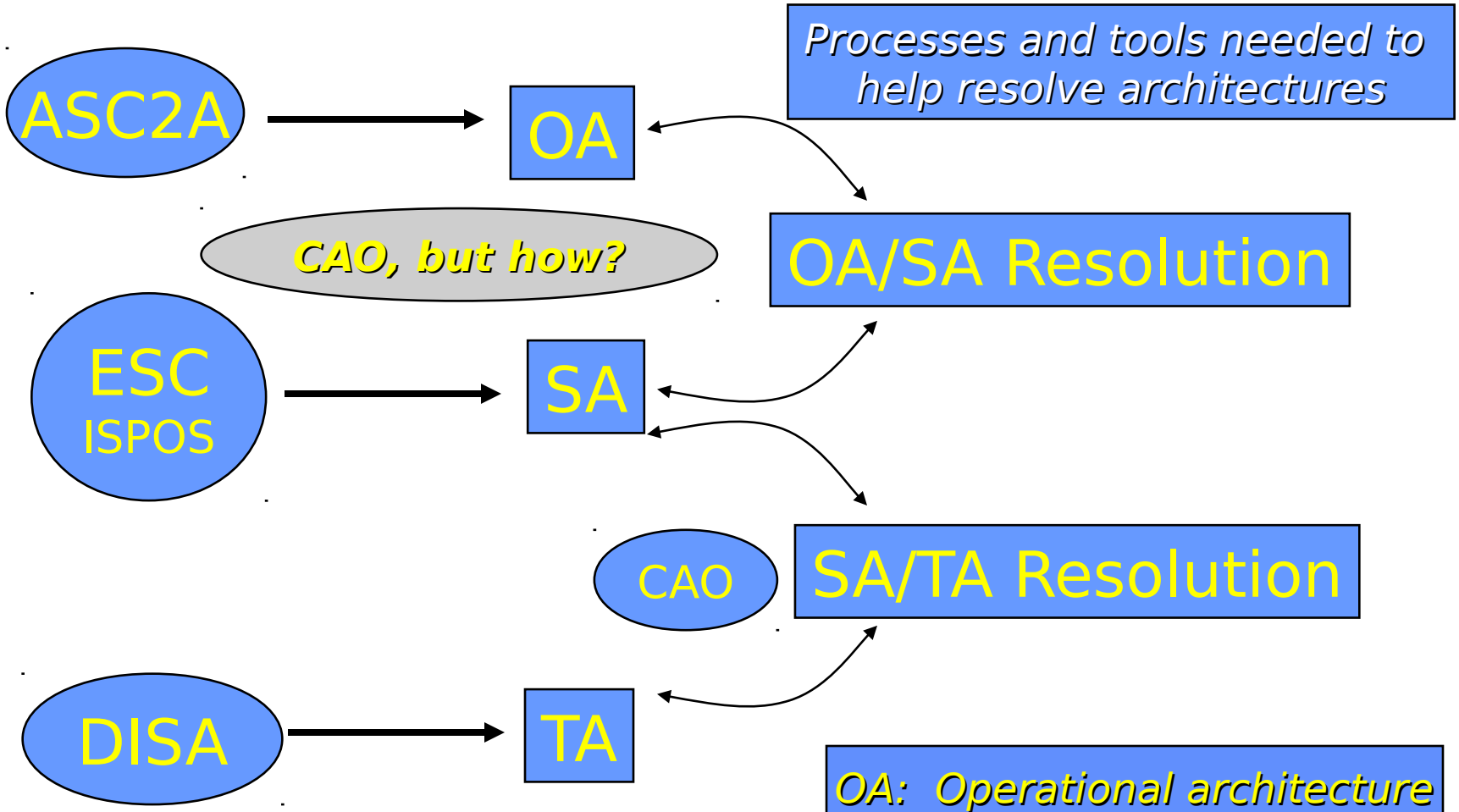
Spiral Development
Today



SBA Supporting Spiral Development Tomorrow

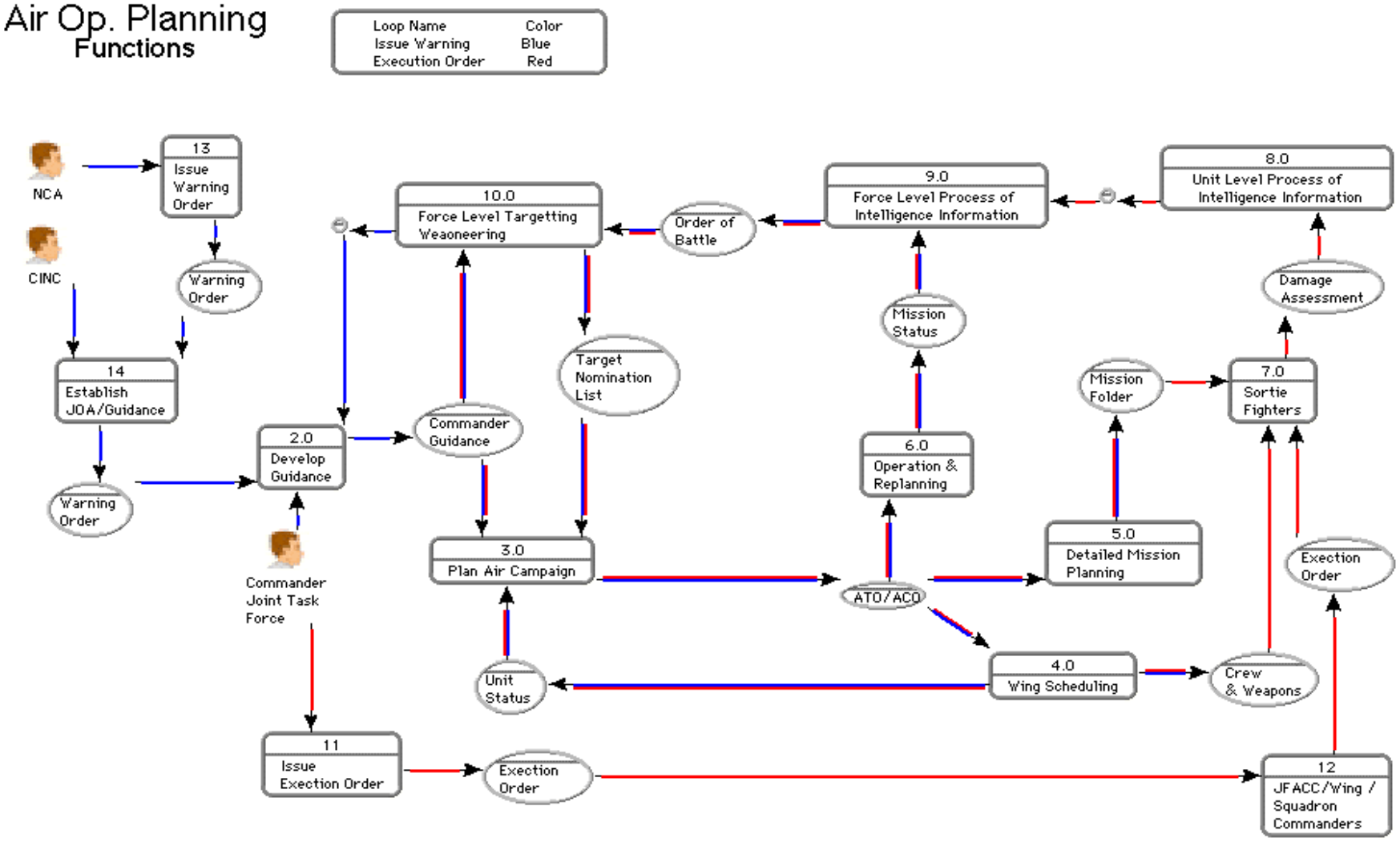


SBA: Large potential payoff for ESC and Users

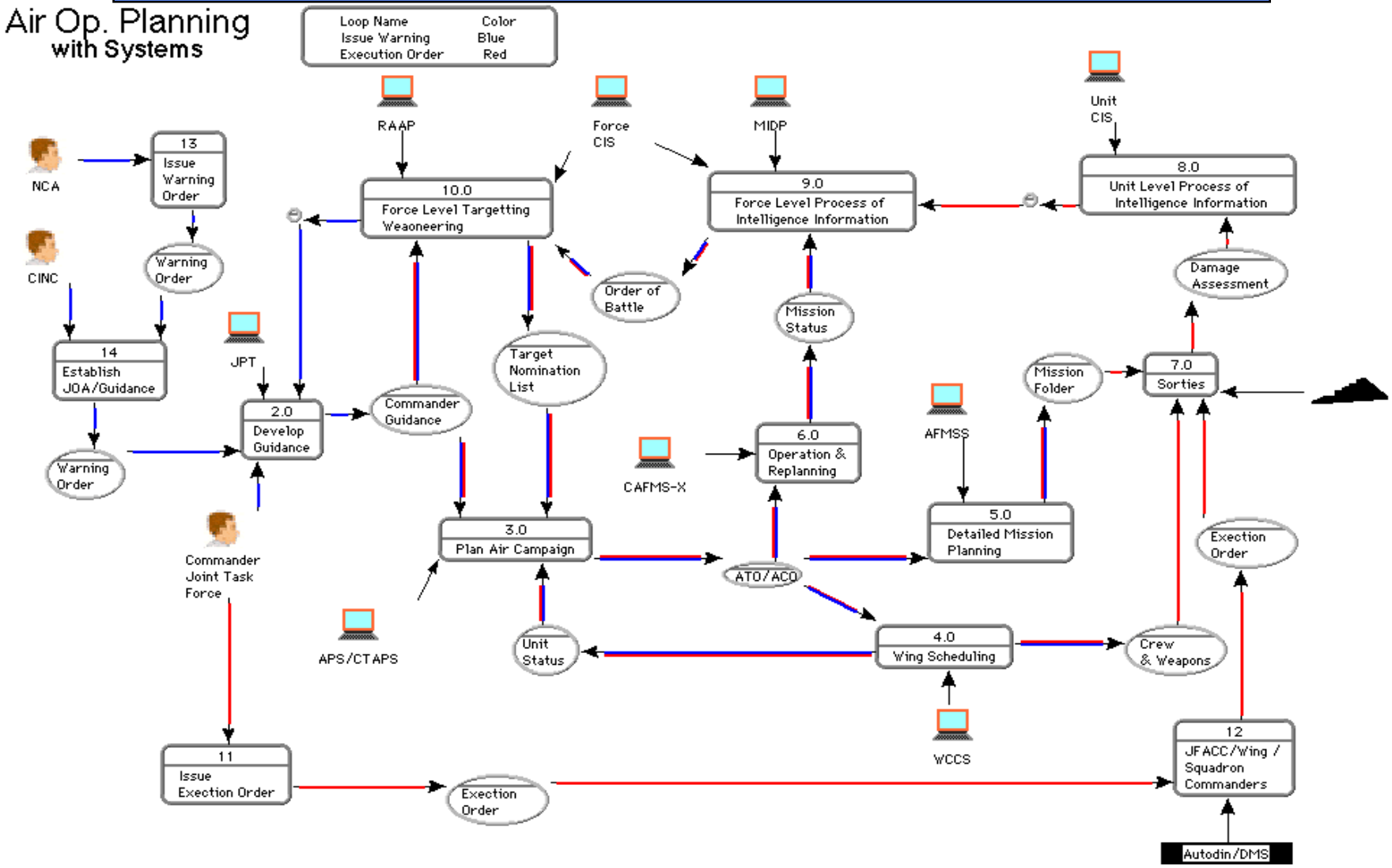


Example: Products Generated by this P

Operational Architecture



Example: Products Generated by this Process



Summary

- **Goal: C2 M&S Center of Excellence**
- **M&S Service Provider**
  - **To SPOs and Warfighters**
  - **State-of-the-Art M&S products, tools and services supporting training, test, acquisition, analysis and decision-making**
- **Analytic M&S to support full range of System Development**
- **Soup-to-nuts technical capabilities to execute a wargame or exercise**
- **Developing Simulation Based Acquisition capabilities**

Recent Efforts

Activity	*Customer*
ILLUMINATE THE C4ISR BATTLESPACE	
• Joint Composite Tracking Net Study	BMDO, JTAMDO
• Joint Cruise Missile Defense Study	AF/XO, JCS/J-8
• ISR Proof of Concept Study	ISR TPIPT
• JSF On/Offboard ISR Trades	JSF PO
• JTIDS Class 2 Milestone III COEA	ACC
• JSTARS Milestone III COEA	ACC
• JPALS Analysis of Alternatives	AFFSA/XR
• TMD Joint Data Net Modeling/Analysis	XRS/ACC/BMDO
• EFX Campaign Analysis	EFX SPO

on-
going